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Cells´ viability changes owing to hypoxia in single culture or co-cultivated leukemic and stem cells

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Preceding researches of hematological malignancies have focused their research on Patient-derived xenograft models when directly insert patient tumor cells into immunodeficient mice. Culture conditions and other factors presented in the leukemic microenvironment don´t reflect the *in vivo* situation and may control behavior of the cultivated leukemic cells resulting in decrease of their viability and influencing other attributes too. We aim our project to conquer these drawbacks by testing new approaches for leukemic cell *in vitro* cultivation comprising inspection of metabolic, proliferative and morphological changes of several leukemic cell types.

As feeder cells we used human dermal fibroblasts (NHDF) and human mesenchymal stem cells. As leukemic cells HBL-2 cell line (Human Mantle Cell Lymphoma); SD-1 cell line (acute lymphoblastic leukemia) and UPF 4D cell line (Diffuse large B-cell lymphoma) were used. Our experiments focused on a single cell cultivation as well as a co-cultivation of selected leukemic and feeder cells performed simultaneously under hypoxic (1% O2) and normoxic (20% O2) conditions. Comprehensive examination of all types of leukemic cells revealed differences in number of cells and a type of energy metabolism, leaning on the form of cultivation, type of used feeder cells as well as on oxygen concentration.

Generally, the leukemic cell lines more proliferated in co-cultivation with both feeders, however, the oxygen concentration was decisive. In co-cultivation with NHDF feeder cells, HBL-2 cells´ proliferation was significantly increased only in hypoxia, while SD-1 cells´ only in normoxia. In case of UPF 4 D cells, hypoxia increased their proliferation in co-cultivation with both types of feeders. The type of energy metabolism of leukemic cells changed in favor of glycolysis with decreasing oxygen concentration. In summary, our findings might be an acquisition for further improvement of the character of leukemic cells *in vitro* for their subsequent usage in successful *in vivo* xenotransplantation.

Biography

Miriama Sikorová is currently a student of the 2nd year of doctoral studies at the 1st Medical Faculty of Charles University in Prague, in the field of Cell Biology and Pathobiology. She has started her research career while studying at university, where she became enthused for molecular, but also immunological and cytological research. She is currently engaged in studies of microenvironment of leukemia cells. Cell cultures and their biochemical, molecular, cytological, microscopic, and no less important statistical analyses take significant proportion of her time. She always tries to research as deeply as possible, in order to understand broader context. Thanks to her own intense interest, as well as an active approach, she constantly advances in acquired theoretical and practical knowledge within the given issue.

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